3.3.6.1 Cedar Glade

3.3.6.1.1 Community Overview

Curtis (1959) described the cedar glade community as a type of savanna. Most cedar glades occur on steep, dry sandstone, quartzite, rhyolite, or dolomite bluffs. The dominant tree is eastern red cedar, which may occur as scattered trees or shrubs, or, in thickets, interspersed with prairie-like openings. Red maple, paper birch and black and bur oaks may also be present. Apart from rocky bluffs, cedar glade may also occur on very dry, gravelly slopes on south- or west-facing morainal ridges, or on coarse-textured sandy terraces along major rivers in western Wisconsin.

Today's dense "cedar thickets" are usually, if not always, the result of fire suppression on dry prairies. Prior to European settlement the cedar glade may have occurred only where extensive cliffs, rivers, or lakes served as firebreaks. Common herbs include native bluestem and grama grasses, prickly-pear cactus, flowering spurge, stiff sandwort, and gray goldenrod. The associated flora strongly resembles those of the dry prairie and sand prairie communities, with elements of dry cliff, oak barrens, and oak openings also present.

A variant of this community that is dominated by northern white cedar, rather than the eastern red cedar typically associated with cedar glades, has been included in the Wisconsin Strategy for Species of Greatest Conservation Need. Cedar glades dominated by northern white cedar are most prevalent in northeast Wisconsin, especially in Door County. Unlike the "eastern red cedar glades", "northern white cedar glades" are not the result of fire suppression on dry prairies. Instead, they occur in areas where dolomite bedrock is exposed or thinly covered by soil. These "northern white cedar glades" may also have openings interspersed among the white cedar with characteristics similar to alvar, boreal rich fen, dry cliff, or moist cliff communities.

3.3.6.1.2 Vertebrate Species of Greatest Conservation Need Associated with Cedar Glade

Twelve vertebrate Species of Greatest Conservation Need were identified as moderately or significantly associated with cedar glade (Table 3-133).

Table 3-133. Vertebrate Species of Greatest Conservation Need that are (or historically were) moderately or significantly associated with cedar glade communities.

Species Significantly Associated with Cedar Glade
Birds
Field Sparrow
Lark Sparrow
Herptiles
Ornate Box Turtle
Northern Prairie Skink
Prairie Racerunner
Western Worm Snake
Yellow-bellied Racer
Prairie Ringneck Snake
Black Rat Snake
Bullsnake
Timber Rattlesnake
Species Moderately Associated with Cedar Glade
Herptiles
Blanding's Turtle

In order to provide a framework for decision-makers to set priorities for conservation actions, the species identified in Table 3-133 were subject to further analysis. The additional analysis identified the best opportunities, by Ecological Landscape, for protection, restoration, and/or management of both cedar glade and associated vertebrate Species of Greatest Conservation Need. The steps of this analysis were:

- Each species was examined relative to its probability of occurrence in each of the 16 Ecological Landscapes in Wisconsin. This information was then cross-referenced with the opportunity for protection, restoration, and/or management of cedar glade in each of the Ecological Landscapes (Tables 3-134 and 3-135).

- Using the analysis described above, a species was further selected if it had both a significant association with cedar glade and a high probability of occurring in an Ecological Landscape(s) that represents a major opportunity for protection, restoration and/or management of cedar glade. These species are shown in Figure 3-30.

Table 3-134. Vertebrate Species of Greatest Conservation Need that are (or historically were) *significantly* associated with cedar glade communities and their association with Ecological Landscapes that support cedar glade.

Cedar Glade	Birds (2)*		Herptiles (9)								
Ecological Landscape grouped by opportunity for management, protection, and/or restoration of this community type	Field Sparrow	Lark Sparrow	Ornate Box Turtle	Northern Prairie Skink	Prairie Racerunner	Western Worm Snake	Yellow-bellied Racer	Prairie Ringneck Snake	Black Rat Snake	Bullsnake	Timber Rattlesnake
MAJOR											
Western Coulee and Ridges	■	■	■	■	■	■	■	■	■	■	■
IMPORTANT											
Northern Lake Michigan Coastal	■										
Southeast Glacial Plains	■	■	■				■				
Western Prairie	■			■	■		■				■
PRESENT (MINOR)											
Central Lake Michigan Coastal	■										
Central Sand Hills	■	■	■				■			■	
Central Sand Plains	■	■					■	■		■	
Southwest Savanna	■		■				■	■		■	■

Color Key

■ = HIGH probability the species occurs in this Ecological Landscape

■ = MODERATE probability the species occurs in this Ecological Landscape

□ = LOW or NO probability the species occurs in this Ecological Landscape

*** The number shown in parentheses is the number of Species of Greatest Conservation Need from a particular taxa group that are included in the table. Taxa groups that are not shown did not have any Species of Greatest Conservation Need that met the criteria necessary for inclusion in this table.**

Table 3-135. Vertebrate Species of Greatest Conservation Need that are (or historically were) *moderately* associated with cedar glade communities and their association with Ecological Landscapes that support cedar glade.

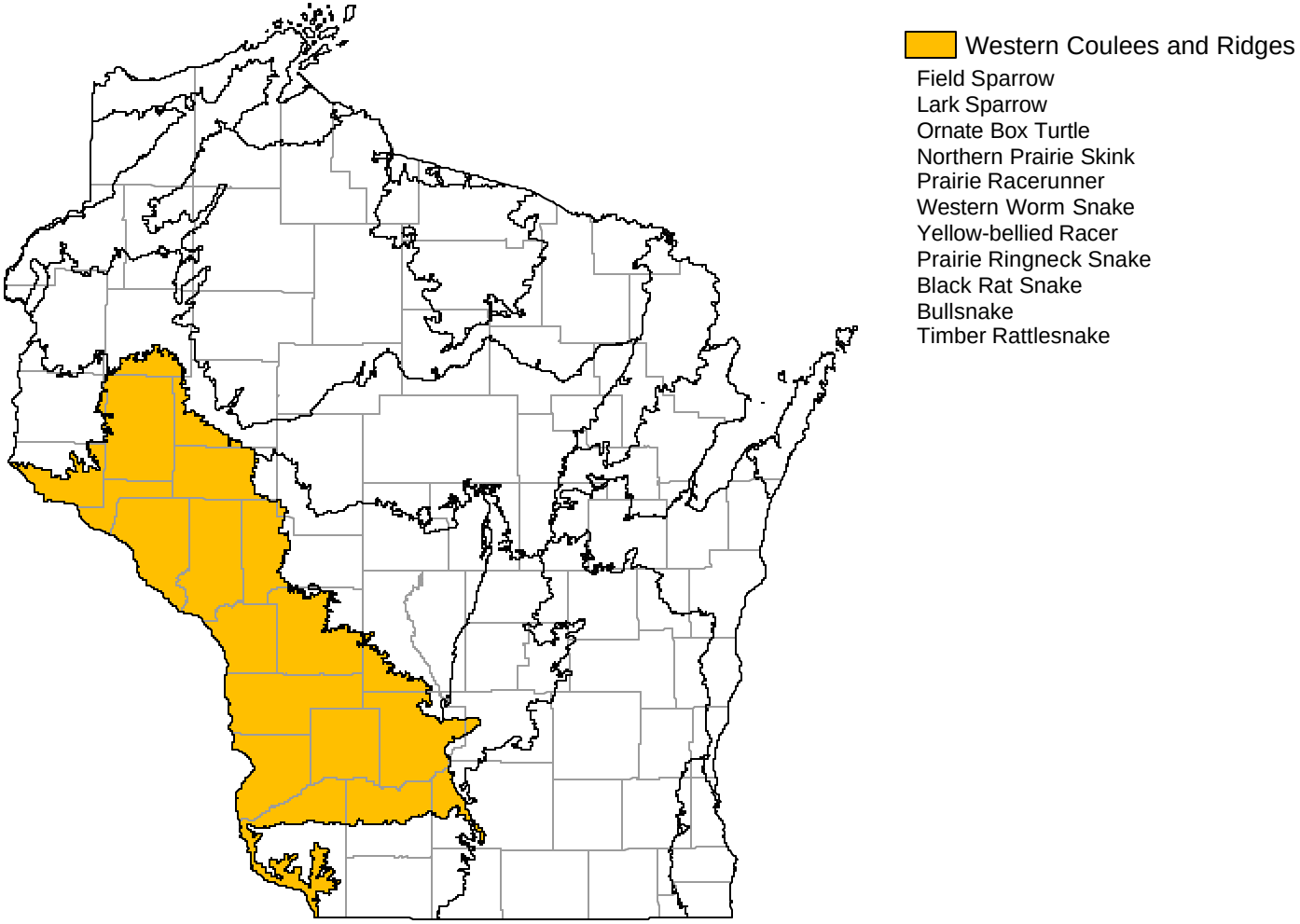
Cedar Glade	Herptiles (1)*
Ecological Landscape grouped by opportunity for management, protection, and/or restoration of this community type	Blanding's Turtle
MAJOR	
Western Coulee and Ridges	
IMPORTANT	
Northern Lake Michigan Coastal	
Southeast Glacial Plains	
Western Prairie	
PRESENT (MINOR)	
Central Lake Michigan Coastal	
Central Sand Hills	
Central Sand Plains	
Southwest Savanna	

Color Key

- = **HIGH probability the species occurs in this Ecological Landscape**
- = **MODERATE probability the species occurs in this Ecological Landscape**
- = **LOW or NO probability the species occurs in this Ecological Landscape**

*** The number shown in parentheses is the number of Species of Greatest Conservation Need from a particular taxa group that are included in the table. Taxa groups that are not shown did not have any Species of Greatest Conservation Need that met the criteria necessary for inclusion in this table.**

Figure 3-30. Vertebrate Species of Greatest Conservation Need that have *both* a significant association with cedar glade *and* a high probability of occurring in an Ecological Landscape(s) that represents a major opportunity for protection, restoration and/or management of cedar glade.



3.3.6.1.3 Threats and Priority Conservation Actions for Cedar Glade

3.3.6.1.3.1 Statewide Overview of Threats and Priority Conservation Actions for Cedar Glade

The following list of threats and priority conservation actions were identified for cedar glade in Wisconsin. The threats and priority conservation actions described below apply to all of the Ecological Landscapes in Section 3.3.6.1.3.2 unless otherwise indicated.

Threats and Issues

- The origin, successional pathway, and management needs of this community type are not well understood. Cedar glades have remained relatively undisturbed because they occupy land too steep for most other uses.
- Limited grazing of cedar glades occurs in some parts of the state, which may favor the increase of eastern red cedar.
- There may be a threat from increasing rural housing development on bluff tops overlooking large rivers in western Wisconsin and on gravelly ridges in the Kettle Moraine area of southeastern Wisconsin, both important settings for this community.
- Cedar glades have probably increased in extent from pre-settlement levels at the expense of dry prairie, because fire suppression has favored the increase and spread of eastern red cedar and associated woody species instead of prairie grasses and forbs. This increase should be viewed as temporary, as cedar thickets should not be equated with "glades".
- Control, even elimination, of eastern red cedar is sometimes an objective of grassland and savanna managers, as this tree has some invasive properties and can suppress the much more highly threatened prairie vegetation. Heavy growths of eastern red cedar can also reduce habitat suitability for sensitive grassland animals, many of which are declining significantly. Glade management probably requires a mix of mechanical removal of woody vegetation and prescribed burning, as eastern red cedar is not a fire resistant species.

Priority Conservation Actions

- More information is needed to understand the origin, successional pathways, conservation benefits, and needs for management of this community type. This community type may not require many conservation actions to sustain it at this time, but should be provided for in areas of historic occurrence; especially on some of the rocky blufflands in southwestern Wisconsin.
- Conflicts with grassland management should be resolved thoughtfully during conservation planning.
- Limiting housing developments on bluff tops in southwestern Wisconsin, especially in areas overlooking major rivers, would maintain conservation options.
- Restricting grazing from glade habitats, especially steep areas, may also help.
- Invasives species issues involve species and challenges similar to those associated with the management of dry prairie, sand prairie, and oak barrens communities.
- A more thorough evaluation of cedar glade is needed in some areas (e.g., along the Niagara Escarpment in the Central Lake Michigan Coastal Ecological Landscape, along the bluffs bordering the St. Croix River in the Western Prairie Ecological Landscape, and in the southern Kettle Moraine region).

3.3.6.1.3.2 Additional Considerations for Cedar Glade by Ecological Landscape

Special considerations have been identified for those Ecological Landscapes where major or important opportunities for protection, restoration, and/or management of cedar glade exist. Those considerations are described below and are in addition to the statewide threats and priority conservation actions for cedar glade found in Section 3.3.6.1.3.1.

Additional Considerations for Cedar Glade in Ecological Landscapes with ***Major*** Opportunities for Protection, Restoration, and/or Management of Cedar Glade

Western Coulee and Ridges

This Ecological Landscape has the best opportunity for maintaining this community type, especially along the steep bluffs of the Wisconsin, Chippewa, Black, and Mississippi Rivers, and locally, along some of the sandy terraces flanking those rivers. Occurrences of this type are found at Blue River Sand Prairie State Natural Area (Iowa County), North Bend Bottoms State Wildlife Area (La Crosse County), Badger Army Ammunition Plant (Sauk County), Devil's Lake State Park (Sauk County), and Brady's Bluff State Natural Area (Trempealeau County).

Additional Considerations for Cedar Glade in Ecological Landscapes with ***Important*** Opportunities for Protection, Restoration, and/or Management of Cedar Glade

Northern Lake Michigan Coastal

Areas of cedar glade with eastern red cedar as the dominant tree species do occur in this Ecological Landscape, but they are not very prevalent. A variant of this community that is dominated by northern white cedar is more common in this landscape, especially in Door County. Northern white cedar glades are associated with areas where dolomite bedrock is exposed or thinly covered by soil. Deer browse is impacting the regeneration of northern white cedar and threatens the longterm persistence of this community type. Northern white cedar glades often intergrade with other communities associated with calcareous substrate such as alvar, boreal rich fen, dry cliff, and moist cliff. Management for northern white cedar glades should occur within the context of these larger community complexes.

Southeast Glacial Plains

This type is found on gravelly glacial moraines, where waterbodies, wetlands, or other features historically offered some protection from fire. Examples of this type in this Ecological Landscape can be found in the Southern Unit of the Kettle Moraine State Forest, Muralt Prairie State Natural Area (Green County), and at a few locations along the Niagara Escarpment. Cedar glade communities should be maintained where ecologically appropriate, and where this goal does not conflict with important opportunities to manage for open grasslands.

Western Prairie

Limited areas of cedar glade occur on steep bluffs along the St. Croix, Apple, and Kinnickinnic Rivers. This type needs additional evaluation in this Ecological Landscape.